



1700 Elm Street SE
Minneapolis, MN 55414

We have prepared a quote for you

Big Ox Energy Dakota City

Quote #TLH-001816 v1

Delivery Date: 12/06/2018

Prepared for:
Big Ox Energy
Desiree McCaslen

Prepared by:
Thomas Halverson

Thursday, December 06, 2018

Big Ox Energy
Desiree McCaslen
2620 Development Drive
Green Bay, WI 54311
dmccaslen@bigoxenergy.com

Dear Desiree,

Pace Analytical Services, LLC (Pace Analytical) appreciates the opportunity to provide our proposal for air emissions testing services. The proposal outlines a scope of work that reflects our interpretation of the information provided. If the proposed scope of work does not address all of your needs, we will gladly revise our proposal pursuant to updated information. We look forward to working with Big Ox Energy on this air emissions testing project.

This proposal provides information on our capabilities and experience, and we would welcome the opportunity for you and your staff to meet and interview our project team. We are accredited by The American Association for Laboratory Accreditation (A2LA) to three environmental testing standards: ASTM D7036 for Air Emissions Testing Bodies, The NELAC Institute (TNI) Field Standard for Field Sampling and Measurement Organizations, and ISO 17025 for General Requirements for the Competence of Testing and Calibration Laboratories.

Through our accreditations and continuous improvement programs, we constantly strive to remain the leading choice for environmental testing. We believe our expertise, experience and qualifications make Pace Analytical the best value for Big Ox Energy.

Thomas Halverson
Sales Director
Field Services Division

● Project Summary

● Project Narrative

Based on the information provided, we propose to conduct emission testing services for Big Ox Energy at their Siouxland facility located at 1616D Avenue, Dakota City Nebraska 68731. We will monitor the emissions from the Enclosed Flare (EP06) and the Biogas Clean-up Skid Scrubber (EP07) over two consecutive days in January 2019. We will monitor the Enclosed Flare emissions for Sulfur Dioxide, Nitrogen Oxides, Carbon Monoxide and VOCs with NDEQ permit CP17-033. We will also test the Scrubber emissions for Hydrogen Sulfide and VOCs to determine the presence odorous compounds.

● Pace Commitment and Expertise

We are dedicated to providing optimal value for your emissions testing project. Our Field Services Division's stack testing experience spans more than three decades. In that time, we have successfully completed many thousands of emissions tests. We have served programs and clients related to all the federal environmental programs including:

New Source Performance Standard (NSPS, 40 CFR 63),
National Emission Standards for Hazardous Air Pollutants (NESHAPS, 40 CFR 61),
National Emission Standards for Hazardous Air Pollutants for Source Categories
(NESHAPS, 40 CFR 63),
Requirements for Preparation, Adoption and Submittal of Implementation Plans
(SIP & PSD, 40 CFR 51).

The Field Services Division has provided compliance testing reports in over 40 states and internationally. Qualified Individuals (QI, QSTI) under ASTM D7036 staff all of our projects and the average tenure of our employees exceeds 10 years. We provide comprehensive cross training to provide a high degree of flexibility and extensive capacity for large projects.

Pace Analytical Field Services invests heavily in new on-site technologies like gas-phase GC/FTIR and maintaining a high degree of expertise. Our multi-discipline staff are adept at applying old and new technologies to challenging environmental issues. We have one of the largest equipment inventories in our business including, 15 isokinetic sampling trains, over 25 instrumental gas analyzers, six gas-phase FTIR systems, the cutting edge gas-phase GC/FTIR, and a multitude of constant rate sampling trains. We design and build much of our own test equipment and employ full time staff dedicated to implementing maintenance and calibration schedules.

● Scope of Testing - Enclosed Flare EP06

● Test Plan or Protocol Preparation

Pre-test Document Submittal For Compliance Testing

● EPA Method 1, 40 CFR 60, Appendix A

Traverse Point locations for equal area representations

● EPA Method 2, 40 CFR 60, Appendix A

Volumetric Airflow by pitot tube differential pressure 3 Runs

● EPA Method 3A, 40 CFR 60, Appendix A

Oxygen and Carbon Dioxide by instrumental gas analyzer monitoring 3 Runs 1 Hour Duration

● EPA Method 6C, 40 CFR 60, Appendix A

Sulfur Dioxide by instrumental gas analyzer 3 Runs 1 Hour Duration

● EPA Method 7E, 40 CFR 60, Appendix A

Oxides of Nitrogen by instrumental gas analyzer. 3 Runs 1 Hour Duration

● EPA Method 10, 40 CFR 60, Appendix A

Carbon Monoxide by instrumental gas analyzer 3 Runs 1 Hour Duration

● EPA Method 25A, 40 CFR 60, Appendix A

Total Hydrocarbons by instrumental gas analyzer (FID) 3 Runs 1 Hour Duration

● EPA Method 320, 40 CFR 61, Appendix A

Moisture and VOCs by real-time, gas phase Fourier Transfer Infrared (FTIR) instrumentation. Measure Methane and odor causing compounds. 3 Runs 1 Hour Duration

● Scope of Testing - Scrubber Exhaust EP07

● Test Plan or Protocol Preparation

Pre-test Document Submittal For Compliance Testing

● EPA Method 1, 40 CFR 60, Appendix A

Traverse Point locations for equal area representations

● EPA Method 2, 40 CFR 60, Appendix A

Volumetric Airflow by pitot tube differential pressure 3 Runs

● EPA Method 3A, 40 CFR 60, Appendix A

Oxygen and Carbon Dioxide by instrumental gas analyzer monitoring 3 Runs 1 Hour Duration

● EPA Method 4, 40 CFR 60, Appendix A

Moisture Content by impinger condensate collection 3 Runs 1 Hour Duration

● EPA Method 320, 40 CFR 61, Appendix A

VOCs by real-time, gas phase Fourier Transfer Infrared (FTIR) instrumentation. Measure odor causing compounds. 3 Runs 1 Hour Duration

● EPA Method 15, 40 CFR 60, Appendix A

Hydrogen Sulfide by Tedlar Bag collection, analysis by GC/FPD 3 Runs 1 Hour Duration

● Project Provisions

● Customer Provisions

By regulatory mandate or simple proximity, many aspects of a successful emission test must be provided by the customer. Many of these provisions should be arranged well in advance of the test. State or local environmental jurisdictions require 30, 45, or 60 days notice of a compliance test.

The customer or facility will provide:

- Testsite with sampling ports and eyebolts.
- Testports cleaned and prepared for testing.
- OSHA compliant sampling platform and safe access.
- Reasonable and adequate access to the test site.
- Electrical power availability within 50 feet of test site.
- Raw material and/or fuel sampling as required.
- Process description and operational records relative to test period.
- Coordination with regulatory agencies.
- Regulatory information forms and certifications.
- Testnotice and TestPlan submittal (Pace can be contracted to write the TestPlan).

Upon award of the project, Pace will provide *Preparing for a Stack Test, A Practical Client Guide*. The Pace Analytical document provides helpful information on many of the items listed above.

● Pace Provisions

Pace Analytical will provide the following items:

- Testmethod preparations.
- Mobilization to the facility.
- Reagents and supplies related to testing.
- Labor and equipment to complete testing defined above.
- Demobilization activities.
- Sample analyses for testing listed above.
- Data assembly and full test report.
- Electronic delivery of test report via email (or other means).

Ancillary services not included in the cost quote are included in the Optional Services section below. Optional services may include test plan preparation, additional testing, additional analyses and extra copies of the test report.

Optional Services	Price
Printed copy of final test report. Standard services includes an electronic version of the report delivered via email or other means. Optional hard copies (paper/bound) can be purchased for an additional fee.	\$100.00
Electronic copy of final test report on CD_ROM. Standard services includes an electronic version of the report delivered via email or other means. Optional CD-ROM copies can be purchased for an additional fee.	\$20.00
Pretest Site Visit Pace representative visit to the test site to review test location logistics and testing details. Local travel included (Twin Cities metro area). Extend travel provided at time and expenses rates.	\$1,450.00
Sulfur Compounds by ASTM D5504, cost per sample Emission samples are collected in a Silica Lined Summa Canister, analysis for Sulfides, Mercaptans and Thiophenes (40 individual sulfur compounds total) using GC/SCD	\$350.00
VOC Compounds by EPA TO-15, cost per sample Emission samples are collected in a Summa Canister, analysis for VOCs (62 individual compounds total) using GC/MS	\$250.00

● Delay and Extension Charges

● On-site Delays

On-site delays - Undisclosed access requirements, incomplete site preparations, process related down-time (including weather), process diagnostics/adjustments, unplanned logistics meetings.

\$90/Hour Per Technician

● Additional Testing

Testing Add-ons - Customer requested additional test runs or tests, unscheduled diagnostic testing, additional source(s), revised scope of work. Significant additions should be requested for potential savings.

\$90/Hour Per Technician

● On-site Delays

Additional Overnight Stays - Additional living expenses when delays or testing add-ons require test personnel to remain overnight. Includes stays necessitated to comply with DOT Hours-of-Service Rules.

\$170/Night Per Technician

Big Ox Energy Dakota City

Prepared by:

Field Services Division

Thomas Halverson
612-607-6398
tom.halverson@pacelabs.com

Prepared for:

Big Ox Energy

2620 Development Drive
Green Bay, WI 54311
Desiree McCaslen
(920) 863-3043
dmccaslen@bigoxenergy.com

Quote Information:

Quote #: TLH-001816

Version: 1
Delivery Date: 12/06/2018
Expiration Date: 03/05/2019

Quote Summary

		Amount
Total:		\$17,190.00

The Order Porter Page is an interface to our quotation. The proposal document and our standard terms and conditions define the commitment and responsibilities for both parties.

Field Services Division

Big Ox Energy

Signature: _____

Name: Thomas Halverson

Title: Sales Director

Date: 12/06/2018

Signature: _____

Name: Desiree McCaslen

Date: _____

● Terms and Conditions

● Pace Standard Terms and Conditions

1. Controlling Provisions - These Standard Terms and Conditions ("Terms") govern the agreed-upon services (the "Project") that Pace Analytical Services, LLC ("Pace") will perform on behalf of Big Ox Energy ("Client") (collectively, the Parties) and supersede any other written provisions (including purchase/work orders) related to the Project, as well as all prior discussions, courses of dealing, or performance.
2. Warranty- Pace hereby warrants that it will: 1) conduct all tests and observations using the protocols and laboratory procedures as specified in accepted task orders, scopes of work, proposals, or written instructions ("Contract Paperwork"); and 2) uphold the reasonable scientific and engineering standards in effect in the industry at the time the service(s) is/are performed. If Client subsequently, including pursuant to an executed amendment, directs different procedures and/or protocols, which may or may not involve the use of any third-party laboratory or contractor, Pace cannot warrant the results and Client shall hold Pace harmless from all claims, damages, and expenses arising from Client's direction.
3. Data- Pace will provide Client with data as specified in the Contract Paperwork. Following final report issuance, Pace will retain back-up data for up to three (3) years and final reports for up to five (5) years. Pending Client's payment in full for Pace's contracted services, Pace may retain any Client data not already released.
4. Intellectual Property/Ownership- Pace shall retain sole ownership of any new method, procedure, or equipment it develops or discovers while performing services pursuant to the Contract Paperwork.
5. Non-competition- Client shall not solicit or recruit Pace personnel for at least 12 months following the termination of the Project governed by these Terms.
6. Sample Delivery, Acceptance, and Containers- Client shall provide Pace with at least 10 business days' prior written notice of the delivery of any sample(s). Within 72 hours following Client's notice, Pace shall issue a written rejection of the sample(s) or its acceptance may be presumed. Notwithstanding the foregoing, Client shall remain liable for any loss or damage to the sample(s) until Pace evidences its acceptance on the chain of custody documents. Pace reserves the right to charge for any sample container(s) that are: a) provided to, but not used, by Client; or b) received by Pace, but not analyzed at Client's request.
7. Sample Storage and Disposal- Pace shall dispose of any non-hazardous sample(s) within 30 days following the issuance of Client's final report unless Client expressly requests otherwise. Pace may charge Client for the costs of storing and disposing of any sample(s) (including extracts) that are, pursuant to Client's request, held for more than 30 days following the issuance of Client's final report. In addition, Pace may return, and Client must accept, any/all highly hazardous, acutely toxic, or radioactive sample(s), sample containers, and residues, as well as any/all sample(s) for which no approved method of disposal exists.
8. Non-Assignment- Neither party may assign or transfer any rights or obligations existing

under these Terms without prior written notice to the other party, except that Pace may, without notice to its Client: a) transfer the Project to another Pace laboratory; or 2) subcontract the Project to a third-party laboratory.

9. Time of Completion; Force Majeure- Pace shall use its best efforts to accomplish the Project within any specified time limitations. Pace shall not be responsible for any non-performance or delay caused by Client, Client's employee, agents, or contractors, or factors or events beyond Pace's control, such as government shutdowns, natural disasters, labor strikes, or acts of God.

10. Compensation-

- a) The pricing offered to Client by Pace is predicated upon Client's acceptance of these Terms. In most cases, the pricing includes all sample containers and preservatives as prescribed by the analytical method requested for each determination. Credit worthiness will be determined based upon an assessment of Client's payment history, credit reports, financial stability, and/or other factors. If Pace is serving as a subcontractor for Client, Pace may seek and receive information about the Prime Client prior to granting credit. If credit is not granted, Client must pay Pace prior to initiation of the Project.
- b) Client agrees to pay for services as documented by Pace and accepted by Client. Payment terms for uncontested invoice items are net 30 days. Client must notify Pace in writing within 15 days of its receipt of the invoice in order to suspend its payment and interest obligations for any disputed invoice items pending resolution. Beginning 30 days after the invoice date, Pace may charge interest on all unpaid and undisputed balances at the rate of 1.5% per month, not to exceed the maximum rate allowed by law. Client may ask Pace to invoice a third party, although Client shall remain ultimately responsible for the payment of any outstanding balance.
- c) Client's failure to pay within 60 days of Pace's dated invoice shall constitute a material breach of these Terms, for which Pace may terminate all of its duties hereunder without liability. If Pace must subsequently take action to collect payment, Client shall pay all associated costs thereof, including attorneys' fees. Any significant changes to the scope of work following the submittal of a price quotation or the delivery of samples to the laboratory are subject to a renegotiation of prices and/or terms relating to the original scope of work. Qualifying changes may include, but are not limited to: QA/QC requirements and procedures; detection limits; samples received and stored, but not analyzed; a decrease in quantity of samples delivered compared to quantity quoted; and reporting and other deliverable format requirements. Pace shall not be required to comply with such changes unless Pace agrees to them in writing.

11. Risk Allocation and Damages- Client accepts that the Project may involve inherent risks and that Pace cannot always guarantee satisfactory results. Notwithstanding the foregoing, if a court of competent jurisdiction finds that Pace failed to meet applicable standards and if Client suffers damages as a result, Pace's aggregate liability for its negligence or

unintentional breach of contract shall not exceed the total fee paid for its services.

This limitation shall not apply to losses arising from Pace's negligence or willful misconduct, so long as:

- a) Client notifies Pace within: 30 days from the date of discovery of Pace's claimed negligence or misconduct; or two years from the date of Client's claimed losses; and
- b) Pace is allowed to investigate and, insofar as possible, mitigate Client's claimed losses.

Neither Pace nor Client shall be liable to the other for special, incidental, consequential, or punitive losses, except as allowed in Section 12. Client Responsibilities below.

12. Client Responsibilities- Client shall:

- a) Provide Pace with full and complete information about all known or reasonably knowable factors that could affect Pace's ability to perform its obligations, and promptly notify Pace if it discovers same following Project initiation;
- b) Enable access by Pace personnel and/or subcontractors to any site where Pace is to perform work, and to all Client personnel who are critical to the success of the Project;
- c) Obtain, on behalf of Pace, any authority or permission required by any third party;
- d) Provide Pace with at least 10 business days' notice of any known or reasonably knowable delay regarding the start-up, progress, or completion of the Project; and
- e) Pay for Pace's reasonable costs to perform any out-of-scope services, such as compliance audits, responding to subpoenas, etc.

If Client defaults on any of these responsibilities and Pace incurs labor and/or material costs as a result, Client shall reimburse Pace for its actual expenses, as well as any lost profits directly attributable to Client's default.

13. Indemnification- Pace shall indemnify and hold Client harmless from and against any demands, losses, damages, and expenses caused by Pace's negligence or willful misconduct, as well as by the negligence and willful misconduct by persons for whom Pace is legally responsible. Client shall likewise indemnify and hold Pace harmless from and against the demands, losses, damages, and expenses caused by Client's negligence or willful misconduct, including Client's use of Pace's name and/or registered mark for anything other than the specific purpose for which it was intended. In addition, Client shall fully indemnify Pace from and against any and all claims by a third party, as well as for all related losses, costs, fees, damages, liabilities or expenses arising out of or relating to Client's breach of these Terms or its violation of applicable laws.

14. Insurance- Pace carries liability insurance with limits as follows:

General liability - \$1,000,000 each occurrence; \$2,000,000 general aggregate;

Personal and advertising injury - \$1,000,000;

Automobile Liability - \$1,000,000 combined single limit;

Excess Liability Umbrella - \$5,000,000 aggregate; \$5,000,000 each occurrence;

Worker's Compensation Insurance - statutory limits; and

Professional Liability \$5,000,000 aggregate, \$5,000,000 per claim.

Pace will, at Client's request, submit certificates of insurance showing limits of coverage.

15. Amendments/Change Orders- Any attempt to modify, vary, supplement, or clarify any provision of these Terms is of no effect unless reduced to writing and signed by both Parties. Any such changes may increase the amount due Pace and affect Pace's obligations towards Client (see Section 2. Warranty).

16. Confidentiality- Each party agrees that if, during the performance of the Project, it becomes aware of any confidential or proprietary information of the other, it will not disclose such information except to those employees, subcontractors, or agents who have expressly agreed to maintain confidentiality.

17. Miscellaneous Provisions-

- a) These Terms supersede all prior negotiations and agreements, written or oral, between Pace and Client with respect to this matter; in no event will other terms – excepting those contained in any individual task order(s) relating to this matter – be considered part of these Terms.
- b) In the absence of an executed agreement between the Parties, the delivery of any sample(s) to a Pace laboratory will constitute acceptance of these Terms by Client.
- c) These Terms shall be construed and interpreted in accordance with the laws of the State of Minnesota without giving effect to the principles of conflicts of law thereof.
- d) Client may publically identify Pace's role as its testing laboratory so long as it immediately retracts or eliminates all such references upon termination of these Terms or Pace's written request.
- e) For purposes of these Terms, the Parties may use and rely upon electronic signatures and documents for the execution and delivery of these Terms and any amendments, notices, records, disclosures, or other documents of any type sent or received in accordance with these Terms.
- f) Pace is an independent contractor; no employer/employee relationship shall arise as a result of the Project.
- g) These Terms shall be binding upon, and inure to the benefit of, the Parties and their respective successors and assigns.

AGREED, as follows:

Big Ox Energy	Pace Analytical Services, LLC
Client Name	
By: _____	By: _____
Name: _____	Name: _____
Title: _____	Title: _____
Date: _____	Date: _____



Pace Analytical®

Stack Testing / Ambient Air

ENVIRONMENTAL TESTING SERVICES

SPECIALTY ANALYTICAL SERVICES

FIELD SAMPLING & ANALYTICAL SERVICES

EMERGENCY DISASTER - ANALYTICAL SUPPORT SERVICES

INSTRUMENT SALES & SERVICES

INDUSTRIAL HYGIENE

PROFESSIONAL STAFFING SERVICES

REGULATORY SERVICES

LIFE SCIENCES



PROTECTING OUR ENVIRONMENT

Why Choose Pace Analytical?

Our emission testing services programs are designed to complement and support your needs by working with facility environmental and process engineers, consultants and government regulatory agencies.

- Full Service Emission Testing Provider
- National Experience - Compliance testing in over (40) states
- Quality Systems: STAC Accreditation, QSTI & NELAP
- Extensive Formalized Safety Program (ISNetworld, BROWZ, PEC Premier, SMI)
- Customer Service: Single Point of Contact and Dedicated Project Management

To maintain and verify that your process sources and production facility are in compliance, you need a successful testing program. Pace Analytical's knowledgeable stack testing staff understand the regulatory requirements, permit specifications and test method procedures to plan and ensure a successful testing event. With over 30 years of experience, our professionals apply innovative solutions to environmental challenges and routine methodologies to serve your emission monitoring needs in a cost-effective manner. We use progressive field technologies that are supported by a network of full service laboratories. This combination of integrated sampling and analytical services is truly unique and offers many advantages for service and quality. Our philosophy is to work in partnership with our clients, providing reliable services to meet not only your regulatory commitments but also your business needs.

Regulatory Compliance, Diagnostic and Engineering Stack Emission Testing in support of the following:

- Maximum Achievable Control Technologies (MACT)
- National Emission Standards for Hazardous Air Pollutants (NESHAP)
- New Source Performance Standards (NSPS)
- Prevention of Significant Deterioration (PSD)
- EPA Title III and Title V Permits
- Clean Air Act Section 112 (r)
- National Ambient Air Quality Standards (NAAQS)
- Emission Control Equipment Specification
- Process Evaluation and Optimization
- CEMs and PEMs Certification (RATA, CGA & COMs)
- Trial Burns & Dry Sorbent Injection (DSI) Studies
- Selective Catalytic and Non-Catalytic Reduction (SCR & SNCR)
- Capture & Destruction Removal Efficiency (DRE)
- Permanent or Temporary Total Enclosure (PTE/TTE)
- Information Collection Rule (ICR) Emission Profiling
- Internal Combustion Engines (RICE & ICE) Part 60 JJJJ & Part 63 ZZZZ
- Leak Detection & Repair (LDAR)

Test Methods

Constituent concentrations and emission rates are determined using United States Environmental Protection Agency (USEPA, EPA) published methods when applicable. Pace Analytical employs USEPA Methods, found in several chapters of the Code of Federal Regulations (CFR 40 Parts 51, 60, 61, 63, 75 & 266), EPA SW-846 and the Compendium of Toxic Organic Methods (TO Methods). In the absence of appropriate EPA Methods, published methods from other sources such as ASTM, NCASI or specially designated individual state test procedures may be proposed. Pace Analytical provides testing services in accordance with the following regulatory methods and standards. Our routine onsite monitoring and laboratory services include:

Specializing in innovative solutions to environmental challenges and continual improvement to routine methodologies.





Quality

Pace Analytical employs a multitude of measures to ensure maximum integrity in sample collection. From impeccably trained field staff to rigorously maintained test equipment, fully documented calibrations and standards, meticulous field documentation and rock solid sample handling and custody, Pace has invested heavily in the infrastructure necessary to collect the highest quality and most reconstructable, defensible environmental data in the industry. The Pace Analytical Field Services Division operates under a robust Quality Management System designed specifically for the rigors and variety of environmental field activities. Many of our competitors often work under an excerpt in a laboratory quality manual — a borrowed system with allowances or none at all. The FSD Quality System has been fully reviewed and reconstructed using ISO 17025 for guidance. Current U.S. environmental field testing accreditation programs in development are based ISO 17025. Our emissions testing departments and Quality System adhere to the ASTM D7036 - 04 Standard Practice for Competence of Air Emission Testing Bodies (AETB). We currently have an accreditation through the Source Testing Accreditation Council (STAC) to be accredited for over 100 test methods and all Team Leaders, Project Managers and Managers are externally certified Qualified Source Testing Individuals (QSTI). To ensure testing integrity and data quality, Pace Analytical observes the USEPA Quality Assurance Handbook for Air Pollution Measurement Systems for the development of training programs and Standard Operating

The above list represents common test methods. We also conduct EPA CTM & OTM procedures. Pace Analytical has the expertise to provide specialized testing for constituents even where there are no EPA methodologies.

Experience

We routinely work with control and process equipment that includes: thermal oxidizers, scrubbers, electrostatic precipitators, cyclone dust collectors & baghouses, boilers & industrial furnaces, flares, turbines, reactors, extruders, kilns, dryers & coolers, vapor combustion units (VCU) and vapor recovery units (VRU).

Our industrial clients include: petroleum refineries and asphalt production, chemical manufacturing, wood pulp & paper, ferrous and non-ferrous foundries, smelting and ore mining operations, municipal sludge, hospital & industrial waste incineration, ethanol & biofuel, agriculture & food processing (corn, soybean, sugar beet), energy & power generation, oil & gas pipelines, pharmaceutical manufacturing, coating & printing facilities, cement production and plastics manufacturing.

Safety

Pace Analytical places a top priority on safety. We have an extensive formalized safety program including frequent training (HAZWOPER, OSHA-10, MSHA) and well-maintained equipment for confined entry, traffic, full protection and personal protection.

Our safety program provides for the welfare of our staff and reduces the chance of issues while on our clients' properties. We participate in ISNetworkworld, PEC Premier, SMI and BROWZ safety management programs, and we currently have "A" ratings with these organizations. Our EMR and OSHA 300 logs are available upon request.



Test Plan Preparation & Compliance Reports

Project planning is critical to producing quality results, on-time delivery and fiscally responsible project management. We work closely with our clients' personnel and regulatory staff to coordinate the execution of all project requirements from inception to final report review. For convenience and consistency, each client will have the same field technical staff and project management assigned to each test event. Test plans are prepared well in advance of the test date for regulatory review and planned site visits. Our report format has been designed based on input from regulatory staff and clients. The report allows for a quick view summary as well as in-depth test specifications. Another service we provide is the entry of results into the EPA Electronic Reporting Tool (ERT).

Gas-Phase FTIR Spectroscopy Services

Emission concerns and plant process improvement are increasingly common needs. Timely resolution to operating issues is critical for cost-effective process improvement and environmental success. Gas-Phase Fourier Transform Infrared (FTIR) Spectroscopy provides real-time evaluation of gaseous constituents to quickly identify problems and implement solutions.

Pace Analytical is the service leader in this cutting-edge technology. Our field professionals are experts in the use of this dynamic measurement tool and have applied this testing technique to a variety of process operations. Gas-Phase FTIR is the superior option when monitoring inorganic gases, acid fumes, volatile and semi-volatile organic compounds (i.e. HAPs). This field analytical technique provides continuous measurements for trending analysis and immediate results, allowing you to make quick decisions.

Pace Analytical routinely employs EPA Methods 318, 320, 321, ASTM D6384 and NIOSH 3800 for air quality investigations, emission compliance, process evaluations and optimization. FTIR chemistries include more than 1,000 identifiable compounds with concentration ranges from low ppm to percent level.

FTIR Chemistries	
Aromatic, Aliphatic, Alcohols	Acid Gases (HBr, HCl, HF, HCN)
Epoxides, Ethers, Ketones	Formaldehyde & other Aldehydes
Greenhouse Gases (Ozone, CFCs)	Inorganic Gases (CO, NH3, N2O, SO2)

Pace Analytical can deploy several FTIR analyzer systems to monitor multiple process inlets and outlets or to specifically resolve low analyte measurements in high gas concentrations.



To discuss your emission testing needs, contact one of our locations:
P: 612.607.6398
P: 612.607.6398
P: 864.980.5092

CEMs, PEMs & COMs Services

Pace Analytical provides certification of your continuous emission monitoring system (CEMs) and continuous optical monitoring systems (COMs) to meet 40 CFR Part 60 and Part 75 regulations. We use performance specifications for evaluating the acceptability of the CEMs after installation, replacement or as specified in the permit regulations. Our knowledge of regulations and our extensive experience with various sources and types of control equipment will assure you of defensible data for compliance to national and local directives for measuring and reporting emissions.

- System Performance (Linearity, Drift, Response)
- Cylinder Gas Audits (CGA)
- Relative Accuracy Test Audits (RATA)
- Continuous Opacity Monitoring Systems (COMs) Performance Specification 1
- Temporary CEMs Rental & Installation

Air Quality Services

Our field staff is trained to conduct onsite ambient fence line, indoor air quality and employee exposure monitoring services following published EPA, NIOSH and OSHA methodologies. Environmental investigations for industry-specific chemicals include: particulates, metals, acid & welding fumes, solvents & VOCs and process gas measurements. Samples are collected using PUF cartridges, Summa canisters, sample bags, sorbent tubes, liquid impingers and filter media.

Ambient & Fence Line Monitoring

- EPA Inorganic Compendium Methods IO-1, 2 & 3 for Particulates PM-10, PM-2.5 & TSP Metals
- EPA Toxic Organic Compendium Methods TO-3, 9, 13, 14, 15, 17 for VOCs, Dioxins & PAHs
- EPA 325 A & B, Passive Fence Line Monitoring
- AP 42 C.1 & C.2 Road Dust
- FERC Noise Monitoring

Pace Analytical provides calibration and maintenance for high volume samplers (BGI, Thermo, Tisch).

Indoor Ambient Air and Personal Monitoring

- NIOSH & OSHA field monitoring, NVLAP accredited laboratory support
- Handheld Monitors for Process Gases (CO, CO2, O2, NOx, SO2, H2S) and Mercury Vapor



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